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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/617,104	07/14/2000	Jonathan D. Halderman	52352-507	5284

7590 03/19/2002

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Washington, DC 20005-3096

EXAMINER

COLLINS, DEVEN M

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 03/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/617,104

Applicant(s)

HALDERMAN ET AL.

Examiner

D. M. Collins

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pine et al. (5,164,022, dated 11/17/92) in view of Hayes (6,114,187, dated 9/5/00).

Pine et al. show the apparatus as claimed in the Figures 1-2 with corresponding text.

In re claim 6, Pine et al. discloses an apparatus for depositing flux 40 on a semiconductor chip, the apparatus comprising:

a support for positioning the semiconductor chip at a predetermined location for depositing flux 40, the semiconductor chip having a plurality of flip-chip bumps arranged on its surface 42; and
a jet printing head for printing a flux 40 pattern, on the flip-chip bumps, the flux 40 pattern substantially identical to an arrangement pattern of the plurality of flip-chip bumps on the

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semiconductor chip, such that the flux 40 is deposited substantially only on the flip-chip bumps, but Pine et al. does not show jet printing means.

However, Hayes discloses a method for preparing a chip scale package using solder jetting technology with a jet printing head (14, 16) for printing a flux pattern, on the flip-chip bumps 9, the flux pattern substantially identical to an arrangement pattern of the plurality of flip-chip bumps 9 on the semiconductor chip 1, such that the flux is deposited substantially only on the flip-chip bumps 9.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Pine et al. in view of Hayes to include a jet printing means, in an effort of applying flux only on the critical surfaces pertaining to flip-chip interconnections.

In re claim 11, Pine et al. in view of Hayes discloses the apparatus of claim 6, wherein the support is a conveying plate 22 transporting the semiconductor chip to the predetermined location 19 for printing the pattern on the flip-chip bumps.

In re claim 12, Pine et al. in view of Hayes discloses the apparatus of claim 11, wherein the conveying plate 22 transports a plurality of semiconductor chips successively arranged thereon to the predetermined location 19 for printing the pattern.

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3. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pine et al. (5,164,022, dated 11/17/92) in view of Hayes (6,114,187, dated 9/5/00) and Master et al. (6,098,867, dated 8/8/00).

Pine et al. in view of Hayes show as stated above but does not show computer data storage.

Master et al. discloses an automated brush fluxing system for application of controlled amount of flux to packages.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Pine et al. in view of Hayes and in further view of Master et al. to include jet printing means and computer data storage, respectively, in an effort to improve the production method of applying flux only on the critical surfaces pertaining to flip-chip interconnections.

In re claim 7, Pine et al. in view of Hayes and in further view of Master et al. discloses the apparatus of claim 6, further comprising data storage 320 storing an arrangement pattern of the flip-chip 206 bumps on the semiconductor chip 204.

In re claim 8, Pine et al. in view of Hayes and in further view of Master et al. discloses the apparatus of claim 7, wherein the arrangement pattern is stored in computer-recognizable data 320 in the data storage.

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In re claim 9, Pine et al. in view of Hayes and in further view of Master et al. discloses the apparatus of claim 8, wherein the jet printing head (14, 16, re Hayes) prints the flux pattern based on the computer-recognizable data stored in the data storage (320 re Master et al.).

In re claim 10, Pine et al. in view of Hayes and in further view of Master et al. discloses the apparatus of claim 7, wherein the jet printing head (14, 16, re Hayes) is capable of printing a plurality of flux patterns corresponding to a plurality of arrangement patterns of flip-chip bumps of semiconductor chips by storing the plurality of arrangement patterns in the data storage (320 re Master et al.).

Response to Arguments

4. Applicant's arguments with respect to claims 6-12 have been considered but are moot in view of the new ground(s) of rejection.

New reference disclosing a method for preparing a chip scale package and product produced by the method.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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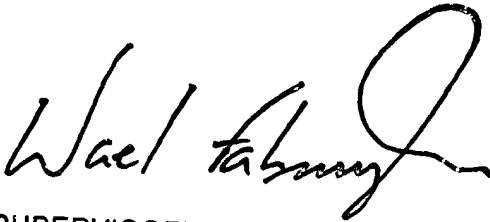
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Deven M. Collins whose telephone number is (703) 305-7840. The examiner can normally be reached on Monday-Friday from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy, can be reached on (703) 308-4918. The fax phone number for this Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

DMC

March 7, 2002


SUPERVISORY PRIMARY EXAMINER
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